



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Hezhu Yin	§	Examiner: Mark Hellner
	§	
Filed: September 20, 2005	§	Art Unit: 3663
	§	
Serial No.: 10/523,124	§	Attorney Docket No.: 2003UR011
	§	
Title: Method To Convert Seismic	§	Confirmation No.: 8232
Traces Into Petrophysical	§	
Property Logs	§	

AFFIDAVIT

STATE OF TEXAS §

COUNTY OF HARRIS §

1. I, Hezhu Yin, am an employee of ExxonMobil Upstream Research Company where I have worked for the past 11 years, and I am the inventor on U.S. Patent Application No. 10/523,124. I am also an adjunct professor with the Department Electrical and Computer Engineering, University of Houston. I have been recognized as a world class industry expert in the field of well logging, petrophysics, and seismic interpretation. I had my Ph.D degree in geophysics from Stanford University. Prior to my current job, I was a research scientist and assistant professor with Lamont-Doherty Earth Observatory, Columbia University, New York City.

Currently, I am a Research Associate with ExxonMobil Upstream Research Company where I have conducted research and developed codes for resistivity tool response modeling, nuclear tool Monte Carlo simulation, acoustic tool response modeling and permeability derivation from Stoneley wave, seismic inversion and interpretation, rockphysics and 3D Petrophysical cube.

I am inventor or co-inventor on 5 US Patents (3 pending):

5,069,308	"Low Impedance Downhole Acoustic Source for Well Logging" (1991)
6,430,509	"Method for 2D Inversion of Dual Laterolog Measurement" (2002)
WO/2004/095072	"Method to Convert Seismic Traces Into Petrophysical Property Logs" (2003)
US 60/644,318,	"Method and Apparatus for Estimating Formation Slowness" (2005)
US 60/693,997,	"Method for Determining Reservoir Permeability from Borehole Stoneley-Wave Attenuation Using Biot's Poroelastic Theory" (2005)

I have authored or coauthored more than 50 articles, and published and presented in various technical journals and conference proceedings. A partial list follows:

1. **Yin**, Hezhu, et al. (2006) "Field and Benchmark Studies of LWD Nuclear Tool Response in High Angle and Horizontal Wells," Transaction of the *SPWLA 47th Annual Symposium*, Vol. 47, Paper-AAA.
2. **Yin**, Hezhu, Dahlberger, K., and Brackett, R.A. (2002) "A Case Study of a Strange Induction Log: Modeling Array-Induction Log Response to Sand Injection," Transaction of the *SPWLA 43rd Annual Logging Symposium*, Vol. 43. Paper-R.
3. **Yin**, Hezhu & Wang, Hanming (2001) "A Practical 2D Dual Laterolog Inversion Method and Its Impact on HPV Estimation," *Society of Exploration Geophysicists*, 71st Annual International Meeting, Technical Program Expanded Abstracts with authors' biographies.
4. **Yin**, Hezhu (2000) "Limitation and Error Inherent in Resistivity Tool Response Modeling for Formation Evaluation," *Society of Exploration Geophysicists*, 70th Annual International Meeting, Technical Program Expanded Abstracts with authors' biographies.

5. **Pirmez**, Carlos; Flood, Roger-D; Baptiste, John; Yin, Hezhu; & Manley, Patricia-L (1997) "Clay content, porosity and velocity of Amazon Fan sediments determined from ODP Leg 155 cores and wireline logs," *Geophysical Research Letters*, Vol. **24**, No. 3, Page 317-320, 1997.
6. **Flood**, Roger D.; Pirmez, Carlos; Yin, Hezhu (1997) "The compressional-wave velocity of Amazon Fan sediments; calculation from index properties and variation with clay content," *Proceedings of the Ocean Drilling Program*; Scientific results, Amazon Fan; covering Leg 155 of the cruises of the drilling vessel JOIDES Resolution, Pages 477-493, Texas A & M University, Ocean Drilling Program, College Station, TX, United States.
7. **Rasolofosaon**, P. and Yin, H. "Simultaneous characterization of anisotropy and nonlinearity in arbitrary elastic media, "Seismic Anisotropy"," *Proceedings of the Sixth International Workshop on Seismic Anisotropy (6IWSA), Soc. Expl. Geoph.*, Tulsa, OK.
8. **Shipley**, Thomas H.; Ogawa, Yujiro; Blum, Peter; Ashi, Juichiro; Brueckmann, Warner; Filice, Frank; Fisher, Andrew T.; Goldberg, David; Henry, Pierre; Housen, Bernard; Jurado, Maria Jose; Kastner, Miriam; Labaume, Pierre; Laier, Troels; Leitch, Evan C.; Maltman, Alex J.; Meyer, Audrey; Moore, Gregory F.; Moore, J. Casey; Peacock, Sheila; Rabaute, Alain; Steiger, Torsten H.; Tobin, Harold J.; Underwood, Michael B.; Xu, Yan; Yin, Hezhu; Zheng, Yan; Zwart, Gretchen; Miller, Christine M. (editor), (1997) "Proceedings of the Ocean Drilling Program, scientific results, Northern Barbados Ridge; covering Leg 156 of the cruises of the drilling vessel JOIDES Resolution, sites 947-949," Texas A & M University, Ocean Drilling Program, College Station, TX, United States.
9. **Dvorkin**, J., Yin, H. (1995) "Contact Laws for Cemented Grains: Implications for Grains and Cement Failure," *Int. J. Solids Structures*, Vol. **32**, No. 17/18, Pages, 2497-2510.

10. **Yin**, Hezhu; Mavko, Gary; Mukerji, Tapan; Nur, Amos (1995) "Scale effects on dynamic wave propagation in heterogeneous media," *Geophysical Research Letters* 22; 23, Pages 3163-3166.
11. **Yin**, Hezhu; Dvorkin, Jack (1994) "Strength of cemented grains," *Geophysical Research Letters*. 21; 10, Pages 903-906.
12. **Shipley**, Thomas H.; Ogawa, Yujiro; Blum, Peter; Ashi, Juichiro; Brueckmann, Warner; Filice, Frank; Fisher, Andrew; Goldberg, David; Henry, Pierre; Housen, Bernard; Jurado, Maria Jose; Kastner, Miriam; Labaume, Pierre; Laier, Troels; Leitch, Evan C.; Maltman, Alex J.; Meyer, Audrey; Moore, Gregory F.; Moore, J. Casey; Peacock, Sheila; Rabaute, Alain; Steiger, Torsten H.; Tobin, Harold J.; Underwood, Michael B.; Xu, Yan; Yin, Hezhu; Zheng, Yan; Zwart, Gretchen; Dearthmont, Lorna-Haskins (editor) (1994) "Structural setting of the Leg 156 area, northern Barbados Ridge accretionary prism," *Proceedings of the Ocean Drilling Program; initial reports, Northern Barbados Ridge; covering Leg 156 of the cruises of the drilling vessel JOIDES Resolution, Bridgetown, Barbados, to Bridgetown, Barbados, sites 947-949.*
13. **Yin**, Hezhu; Goldberg, David (1994) "How much is fluid pressure responsible for +/- seismic reflections in the accretionary prism of the northern Barbados Ridge?" AGU 1994 fall meeting. EOS, Transactions, *American Geophysical Union*. 75; 44, Suppl., Pages 588. 1994.
14. **Dvorkin**, Jack; Yin, Hezhu; Knight, Rosemary (1994) "Seismic detection of residual contaminants," *SEG Annual Meeting Expanded Technical Program Abstracts with Biographies*. 64; Pages 584-586.
15. **Yin**, Hezhu; Rasolofosaon, Patrick, N. J. (1994) "Nonlinear and linear elastic behavior of anisotropic rocks; ultrasonic experiments versus theoretical predictions," *SEG Annual Meeting Expanded Technical Program Abstracts with Biographies*. 64; Pages 1129-1132.

16. **Yin**, Hezhu; Mavko, Gary; Mukerji, Tapan; Nur, Amos (1994) "Scale-dependent dynamic wave propagation in heterogeneous media; I, Experiments," *SEG Annual Meeting Expanded Technical Program Abstracts with Biographies*. 64; Pages 1147-1150.
17. **Goldberg**, David; Yin, Hezhu (1994) "Compaction effect on porosity and sonic velocity; integration of core and LWD from the Barbados accretionary prism," EOS, Transactions, *American Geophysical Union*. 75; 44, Suppl., Pages 310.
18. **Yin**, Hezhu (1993) "Acoustic velocity and attenuation of rocks; isotropy, intrinsic anisotropy, and stress-induced anisotropy," Doctoral Dissertation, Stanford University. Stanford, CA, United States. Pages: 246.
19. **Yin**, Hezhu; Mavko, Gary; Nur, Amos (1993) "Grain size effects on porosity, permeability and acoustic velocities of granular materials," EOS, Transactions, *American Geophysical Union*. 74; 43, Suppl., Pages 568.
20. **Dvorkin**, Jack; Yin, Hezhu; Nur, Amos (1993) "Strength of cemented grains," EOS, Transactions, *American Geophysical Union*. 74; 43, Suppl., Pages 580.
21. **Yin**, Hezhu; Nur, Amos (1993) "Porosity, permeability, and acoustic velocity in granular materials," *SEG Annual Meeting Expanded Technical Program Abstracts with Biographies*. 63; Pages 775-778.
22. **Pirmez**, Carlos; Flood, Roger D.; Baptiste, John; Yin, Hezhu; Manley, Patricia L. (1997) "Clay content, porosity, and velocity of Amazon Fan sediments determined from ODP Leg 155 cores and wireline logs," *Geophysical Research Letters*. 24; 3, Pages 317-320.
23. **Flood**, Roger D.; Pirmez, Carlos; Yin, Hezhu, (1994) "The compressional-wave velocity of Amazon Fan sediments; calculation from index properties and variation with clay content," *Proceedings of the Ocean Drilling Program*; Scientific results, Amazon Fan; covering Leg 155 of the cruises of the drilling vessel JOIDES Resolution, Bridgetown, Barbados, to Bridgetown, Barbados, sites 930-946.

I have also authored and coauthored more than 60 company proprietary research reports, research memo, and research application reports.

I have more 24 years experiences of teaching and research in the fields of Well Logging, log and seismic inversion, and interpretation. I am member of American Geophysical Union, Society of Exploration Geophysicists, and Society of Petrophysicists and Well Log Analysts. I have acted as technical expert reviewers for the journal of The Leading Edge, Geophysics, Petrophysics, and for the articles of Annual Technical Conference Transactions of SEG and SPWLA.

2. I have read the "Remarks" section of the response to the Office Action mailed on June 23, 2006, a copy of which section is attached hereto. Except for legal arguments which I am not qualified to assess, I agree with all arguments and opinions expressed therein including, without limitation, all interpretations of what the prior art teaches or suggests, and all explanations and clarifications of what is disclosed in the present application and in the prior art (specifically the King paper and the Taner patent, both of which I have read), including what a person of ordinary skill in the art would or would not understand the documents to mean, and all comparisons of the present application to the prior art in terms of their technical teachings.


Hezhu Yin

Sworn to and subscribed before me this 15th day of August, 2006.




Monica Stansberry, Notary Public - State of Texas